

What is claimed is:

1 1. An apparatus, comprising:
2 an array of optical fibers;
3 at least one wavelength sieve/combiner that operates on discrete wavelength units;
4 and
5 a first array of micro mirrors;
6 wherein said optical wavelength sieve/combiner is optically interposed between
7 said array of optical fibers and said array of micro mirrors.

1 2. The invention as defined in claim 1 wherein any wavelength within one of said
2 discrete wavelength units is supplied to or received from the same beam position by said
3 wavelength sieve/combiner.

1 3. The invention as defined in claim 1 further comprising an array of micro
2 lenses, one micro lens for each optical fiber in said array of optical fibers, said micro
3 lenses being optically interposed between said array of optical fibers and said wavelength
4 sieve/combiner.

1 4. The invention as defined in claim 1 further comprising an array of collimators,
2 one collimator for each optical fiber in said array of optical fibers, each of said
3 collimators being attached to one of said optical fibers, said collimators being optically
4 interposed between said optical fibers and said wavelength sieve/combiner.

1 5. The invention as defined in claim 1 further comprising a first focusing system
2 that focuses output beams from said wavelength sieve/combiner onto said first array of
3 micro mirrors.

1 6. The invention as defined in claim 5 wherein said first focusing system
2 comprises a lens.

1 7. The invention as defined in claim 5 wherein said first focusing system
2 comprises a prism.

1 8. The invention as defined in claim 1 wherein said wavelength sieve/combiner
2 comprises at least one thin film optical filter.

1 9. The invention as defined in claim 8 wherein said at least one thin film optical
2 filter is mounted on a substrate.

1 10. The invention as defined in claim 8 wherein said at least one thin film optical
2 filter is mounted on a glass substrate.

1 11. The invention as defined in claim 8 wherein said at least one thin film optical
2 filter is freespace suspended.

1 12. The invention as defined in claim 8 wherein said at least one thin film optical
2 filter passes a portion of all of the wavelengths incident upon it and reflects a portion of
3 all of the wavelengths incident upon it, whereby a copy of the incident wavelengths is
4 created.

1 13. The invention as defined in claim 8 wherein said at least one thin film optical
2 filter passes a portion of some of the wavelengths incident upon it and reflects a portion
3 of some of the wavelengths incident upon it, whereby a copy of the incident wavelengths
4 that a portion is passed for is created.

1 14. The invention as defined in claim 1 wherein there is a plurality of said
2 wavelength sieve combiners.

1 15. The invention as defined in claim 1 wherein there is a plurality of said
2 wavelength sieve combiners and each of said wavelength sieve/combiners is formed from
3 respective portions of a plurality of strips of thin film optical filters.

1 16. The invention as defined in claim 1 wherein each of said at least one
2 wavelength sieve/combiners is adapted to supply as output one beam for a discrete
3 wavelength unit for each of a plurality of strips of thin film optical filters incorporated
4 therein.

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1 17. The invention as defined in claim 1 further comprising at least one sensor for
2 detecting light at at least a prescribed one of said discrete wavelength units

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1 18. The invention as defined in claim 17 wherein said at least one sensor is
2 mounted on said at least one wavelength sieve/combiner.

1 19. The invention as defined in claim 1 wherein at least one micro mirror of said
2 array of micro mirrors can tilt around two axes.

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1 20. The invention as defined in claim 19 wherein each of said two axes are
2 substantially orthogonal to the other.

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1 21. The invention as defined in claim 1 further comprising
2 a second array of micro mirrors;
3 wherein said optical wavelength sieve/combiner is also optically interposed
4 between said array of optical fibers and said second array of micro mirrors.

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1 22. The invention as defined in claim 21 further comprising a focusing system
2 that focuses output beams from said wavelength sieve/combiner onto said second array of
3 micro mirrors.

1 23. The invention as defined in claim 5 further comprising:
2 a second array of micro mirrors, wherein said optical wavelength sieve/combiner
3 is also optically interposed between said array of optical fibers and said second array of
4 micro mirrors; and
5 a second focusing system that focuses output beams from said wavelength
6 sieve/combiner onto said second array of micro mirrors.

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7 24. The invention as defined in claim 23 wherein said first focusing system and
8 said second focusing system are different.

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9 25. The invention as defined in claim 23 wherein said first focusing system and
10 said second focusing system are the same.

1 26. The invention as defined in claim 1 wherein said apparatus is adapted to
2 operate at least in part in a broadcast mode.

1 27. The invention as defined in claim 1 wherein said apparatus is adapted to
2 operate at least in part as a multiplexer.

1 28. The invention as defined in claim 1 wherein said apparatus is adapted to
2 operate at least in part as a demultiplexer.

1 29. The invention as defined in claim 1 wherein said apparatus is adapted so that
2 beams from said optical fibers are converging prior to encountering said at least one
3 wavelength sieve/combiner.

1 30. The invention as defined in claim 29 further comprising a prism optically
2 interposed between said wavelength sieve/combiner and said array of micro mirrors.

- 1 31. An apparatus, comprising:
- 2 a sieve/combiner; and
- 3 an array of micro mirrors;
- 4 wherein said sieve/combiner is optically interposed between said array of micro
- 5 mirrors and an array of optical elements at least one of which is adapted to supply an
- 6 optical beam to said apparatus and at least one of which is adapted to receive an optical
- 7 beam from said apparatus.